

REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. Applicant would also like to thank the Examiner for issuing a revised Office action correcting errors presented in the prior Office action. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Initially, it is noted that an amendment to claim 1 is tendered herein. It is submitted that the amendment to claim 1 places the application in a condition for allowance. Accordingly, entry of the amendment is requested.

In the Office action, claim 12 was rejected under 35 U.S.C. 112, first paragraph, as being directed toward subject matter which is not enabled by the specification. Claim 12 has been cancelled. As such, the rejection thereof has been rendered moot.

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Itou et al. (JP 08-259767). The rejection is traversed for the following reasons.

Claim 1 is directed to a method for manufacturing a fuel cell separator. The method includes steps of obtaining a mixture by mixing a thermoplastic resin and a conductive material, using the mixture to form a separator starting material having gas flow passage grooves in a contact face, and irradiating the contact face of the separator starting material with an electron beam. It is further noted that claim 1 has been amended to clarify that the irradiating step involves irradiating the contact face of the separator starting material with an electron beam "**so as to harden the**

contact face to a degree that the thermoplastic resin of the contact face has a 3-dimensional bridge structure and the thermoplastic resin of a part other than the contact face of the separator starting material keeps an elasticity thereof".

The amendment finds support on page 16, lines 22 – 28, page 18, lines 4 – 11, page 19, lines 12 – 25, and page 20, lines 9 – 17.

The combination of the 3-dimensional bridge structure of the contact face and the synthetic resin elasticity of a part other than the contact face allows the contact face to be placed in an excellently sealed state relative to the diffusion layer. Further, by hardening the contact face, the sealed state can be maintained even when the contact face becomes softened by fuel cell reaction heat. In contrast, if the whole separator is hardened through electron-beam irradiation, the elasticity of the separator will be considerably reduced, thereby making the achievement of a desired sealing action relative to the diffusion layer impossible.

The Itou reference discloses a bipolar board formed from a thermoplastic resin (such as ethylene vinyl acetate copolymer) that is subjected to an electron beam irradiation bridging or cross-linking process. However, Itou does not disclose an electron beam irradiation step as recited in claim 1. Particularly, Itou fails to disclose an electron beam irradiation wherein the contact face of the separator starting material is hardened to a degree that the thermoplastic resin of the contact face has a 3-dimensional bridge structure and the thermoplastic resin of a part other than the contact face of the separator starting material keeps an elasticity thereof.

Thus, claim 1 recites features that are not taught by the Itou reference. Accordingly, Itou fails to anticipate claim 1. Reconsideration and withdrawal of the rejection of claim 1 is requested.

Claims 9 – 11 were rejected under 35 U.S.C. 102(b) as being unpatentable over Ohara et al. (US 2002/0197523) in view of evidence presented in Haas (U.S. Patent No. 6,532,275). The rejections are traversed for the following reasons.

Claims 9 and 10 are directed to methods for manufacturing a fuel cell separator by obtaining a mixture by mixing a thermoplastic resin and a conductive material, using the mixture to form a separator starting material having gas flow passage grooves in a contact face, and irradiating the contact face of the separator starting material with an electron beam. The Ohara reference is cited for disclosing a method of making a fuel cell separator having gas flow passage grooves, where the separator is formed by mixing a thermoplastic resin consisting of polyphenylene sulfide and a graphite conductive material. The Haas reference is cited as providing evidence that graphite is known in the art to be black lead.

However, Ohara does not teach irradiating a contact face of separator starter material, as is required by both claims 9 and 10. For this feature, the Examiner looks to paragraphs 57 – 59 and 117 of Ohara. Therein, Ohara discusses ultrasonic injection molding which involves resonating the entire mold by ultrasonic vibrations. Shaking the mold does not, however, teach irradiating a separator starting material with an electron beam, as is required by both claims 9 and 10. Accordingly, the Ohara reference fails to teach that for which it is cited.

As the Haas reference is also silent as to an electron beam irradiation of a contact face of a separator starting material, claims 9 and 10 recite features that are not taught by the cited references. Thus, the cited references fail to anticipate claims 9 and 10. Reconsideration and withdrawal of the rejections of claims 9 and 10 is requested. It is further noted that claim 11 depends from claim 9 and is

therefore also considered allowable over the art.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Ohara et al. (US 2002/0197523) in view of Kearl (US 2003/0022052). As mentioned above, claim 12 has been cancelled. As such, the rejections of claim 12 have been rendered moot.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SHM-15810.

Respectfully submitted,

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